

# Notes - Writing Equations of Exponential Functions

Parent Function:  $y = a \cdot b^x$

Ex 1: Write the eq. of the exp. function through the points (0, 5) and (1, 15)

x	y
0	5
1	15

$5 \cdot 3 = b$   $a = 5$

$$y = 5 \cdot 3^x$$

Ex 2: Through the points (0, 12) and (1, 3)

x	y
0	12
1	3

$12 \cdot \frac{1}{4} = b$   $a = 12$

$$y = 12 \left(\frac{1}{4}\right)^x$$

Ex 3: Through (0, 5) and (2, 20)

x	y
0	5
1	10
2	20

$5 \cdot 2 = b$

$$y = a \cdot b^x$$

$$20 = 5 \cdot b^2$$

$$\frac{20}{5} = \frac{5 \cdot b^2}{5}$$

$$4 = b^2$$

$b = 2$

$$y = 5(2)^x$$

→ plug in  
 $x = 2$  and  
 $y = 20$

Ex 4: Through  $(0, 3)$  and  $(4, 21)$

$$a=3$$

$$x=4 \quad y=21$$

$$y = a \cdot b^x$$

$$\frac{21}{3} = \frac{3 \cdot b^4}{3}$$

On Calc

$$\sqrt[4]{7} = \sqrt[4]{b}$$

4, Math,  $\sqrt{x}$ , 7, enter  
root #, Math,  $\sqrt{x}$ , #, enter

$$b = 1.627$$

$$y = 3(1.627)^x$$

Ex 5: Through  $(2, 12)$  and  $(3, 24)$

$$a=3$$

x	y
0	3 $3 \div 2$
1	6 $6 \div 2$
2	12 $12 \div 2 = b$
3	24 $24 \div 2 = b$

$$12 = a \cdot 2^2$$

$$\frac{12}{4} = \frac{a \cdot 4}{4}$$

$$a = 3$$

$$y = 3(2)^x$$